

TA-3650

*UK Model
AEP Model*



INTEGRATED STEREO AMPLIFIER

SPECIFICATIONS

GENERAL

Power Requirements: 110, 127, 220 or 240 V ac adjustable, 50/60 Hz

Power Consumption: 320 W (UK model)
540 W (AEP model)

Dimensions: Approx.
460 (w) x 170 (h) x 325 (d) mm
18 1/8 (w) x 6 5/8 (h) x 12 7/8 (d) inches
Including projecting parts and controls

Weight: Approx. 12.0 kg, 26 lb 8 oz (net)
Approx. 14.5 kg, 32 lb (with shipping carton)

POWER AMPLIFIER SECTION

Continuous RMS Power Output: Both channels driven simultaneously
(rated output)
(Less than 0.1 % harmonic distortion)
At 20 – 20,000 Hz
55 + 55 W (8 Ω)
At 1 kHz
60 + 60 W (8 Ω)
70 + 70 W (4 Ω) (AEP model)
According to DIN 45500
55 + 55 W (8 Ω)

Dynamic Power Output: 170 W (8 Ω)
(IHF constant power supply method)
200 W (4 Ω) (AEP model)

Power Bandwidth: 5 – 40,000 Hz, IHF

Damping Factor: 35 (8 Ω , at 1 kHz)

Harmonic Distortion: Less than 0.1 % at rated output
Less than 0.03 % at 1 W output

IM Distortion: Less than 0.1 % at rated output
(60 Hz : 7 kHz = 4 : 1)
Less than 0.03 % at 1 W output

Frequency Response: 3 – 100,000 Hz ± 2 dB
(at 1 W output)

S/N Ratio: Greater than 110 dB, short-circuited input

Residual Noise: Less than 0.008 μ W (8 Ω)

Inputs: POWER IN
Sensitivity 1.0V (for rated output)
Impedance 47 k Ω

Outputs: SPEAKER A, B
Accept speakers of 8 Ω or more.
(UK model)
Accept speakers of 4 – 16 Ω
(AEP model)

HEADPHONES
Accepts low and high impedance headphones

— continues to page 2 —

SONY®

SERVICE MANUAL

PREAMPLIFIER SECTION

Inputs:

	Sensitivity	Impedance	Maximum Input Capability (THD 0.1 %)	S/N (weighting network, input level)
PHONO 1, 2	2.5 mV (-50 dB)	50 k Ω	210 mV	70 dB (B. 2.5 mV)
TUNER AUX TAPE 1, 2 REC/PB	150 mV (-14.5 dB)	100 k Ω		90 dB (A. 150 mV)

Outputs:

	Output Level	Impedance
REC OUT 1, 2	150 mV	10 k Ω
REC/PB	17 mV	82 k Ω
PRE OUT	1.0 V	1.8 k Ω

Harmonic Distortion: Less than 0.05 % at rated output

IM Distortion: Less than 0.05 % at rated output
(60 Hz : 7 kHz = 4 : 1)

Frequency Response: PHONO 1, 2 RIAA equalization curve ± 0.5 dB
 TUNER
 AUX
 TAPE 1, 2 } 10 Hz - 100 kHz ± 0 dB
 REC/PB }
 (input)

Tone Controls: BASS
 ± 10 dB at 50 Hz (TURNOVER FREQ 250 Hz)
 ± 10 dB at 100 Hz (TURNOVER FREQ 500 Hz)
 TREBLE
 ± 10 dB at 10 kHz (TURNOVER FREQ 2.5 kHz)
 ± 10 dB at 20 kHz (TURNOVER FREQ 5 kHz)

Filters: LOW 6 dB/oct. below 30 Hz
 HIGH 6 dB/oct. above 10 kHz

Loudness: +10 dB at 50 Hz, +3 dB at 10 kHz
 (att. 30 dB)

Presence: +2.5 dB at 1 kHz
 (att. 30 dB)

Residual Noise: Less than 0.15 μ V
 (VOLUME minimum; TONE,
 FILTERS, LOUDNESS, and
 PRESENCE off)

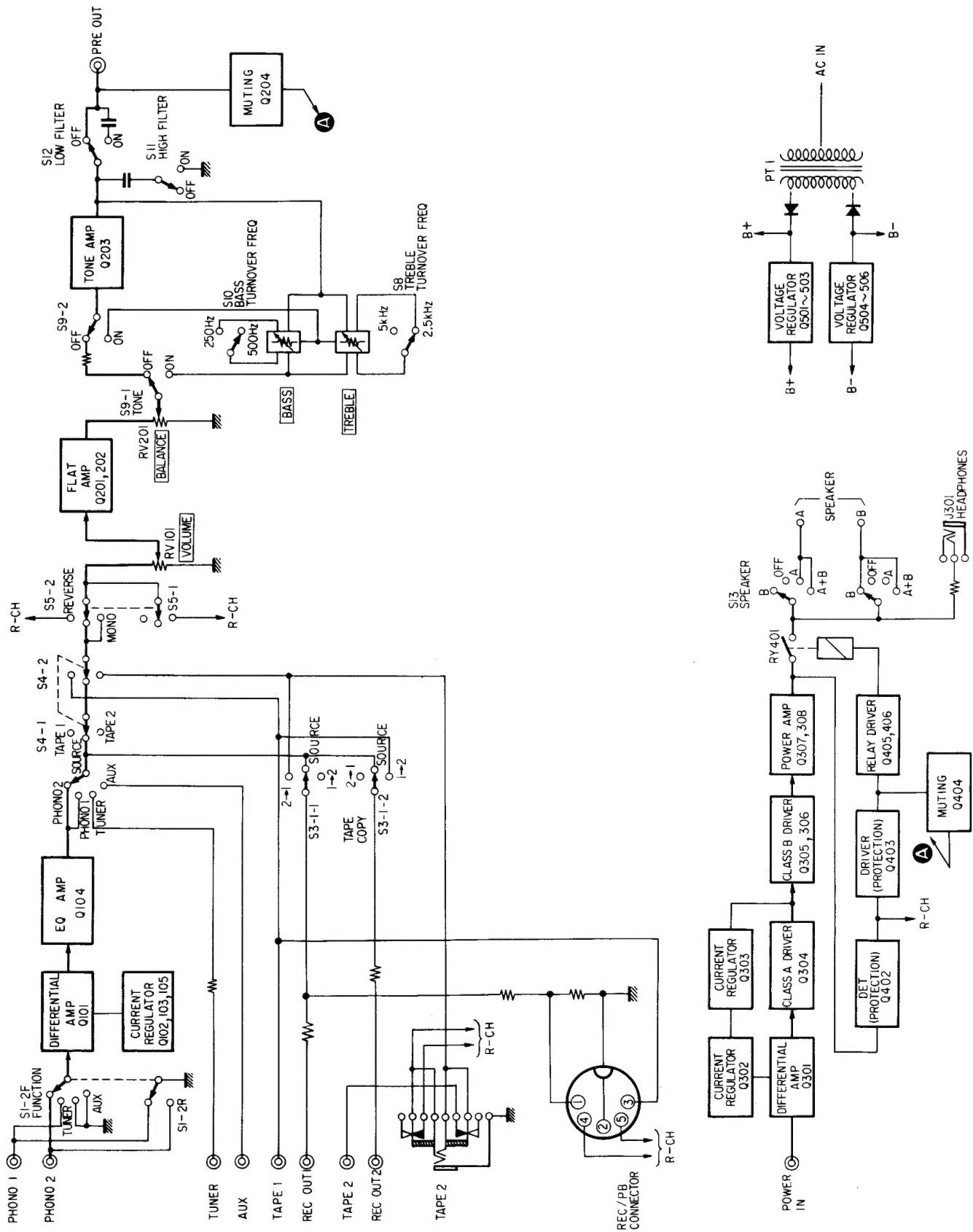
SECTION 1
OUTLINE

IDENTIFICATION OF SET

TA-3650 is classified by the specification label as shown below.

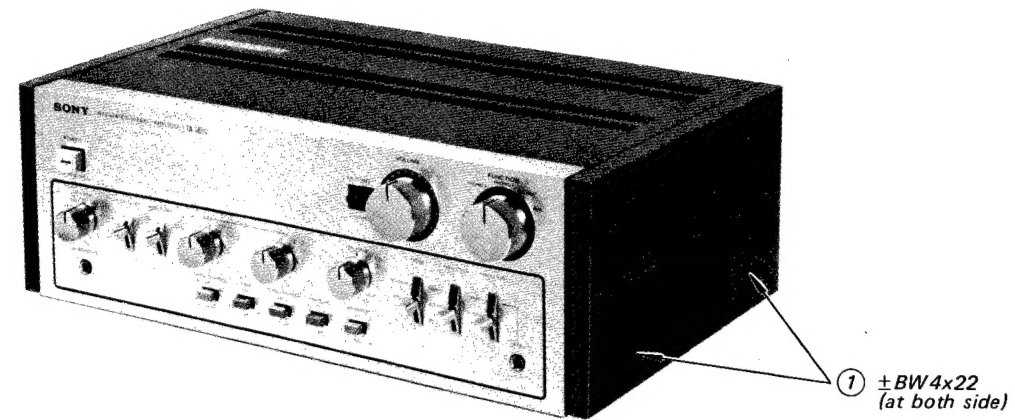
	Specification Label
UK Model	<div><div>SONY®</div><div>INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 320W SERIAL NO. _____ MADE IN JAPAN</div></div>
AEP Model	<div><div>SONY®</div><div>INTEGRATED STEREO AMPLIFIER MODEL NO. TA-3650 AC 110.127.220.240V~ 50/60Hz 540W SERIAL NO. _____ MADE IN JAPAN</div></div>

BLOCK DIAGRAM

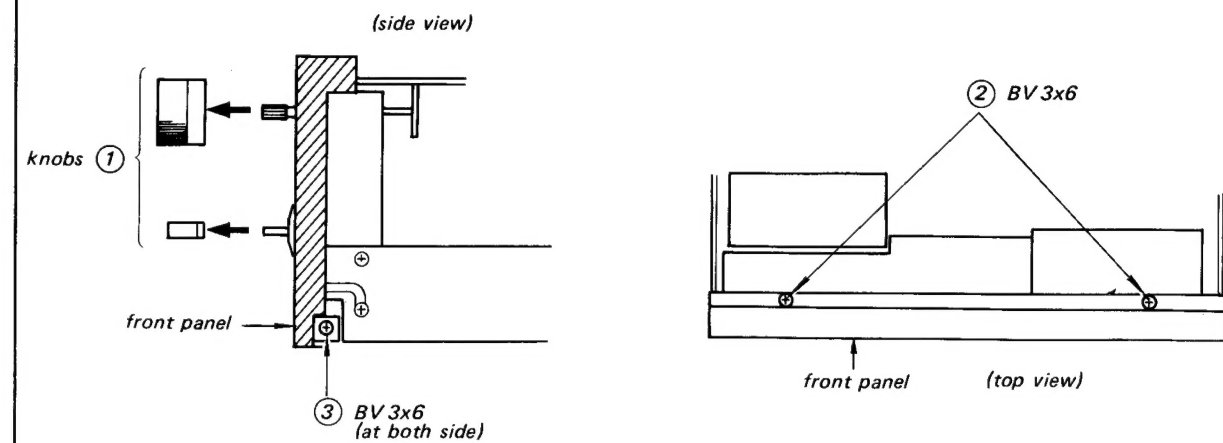


SECTION 2 DISASSEMBLY

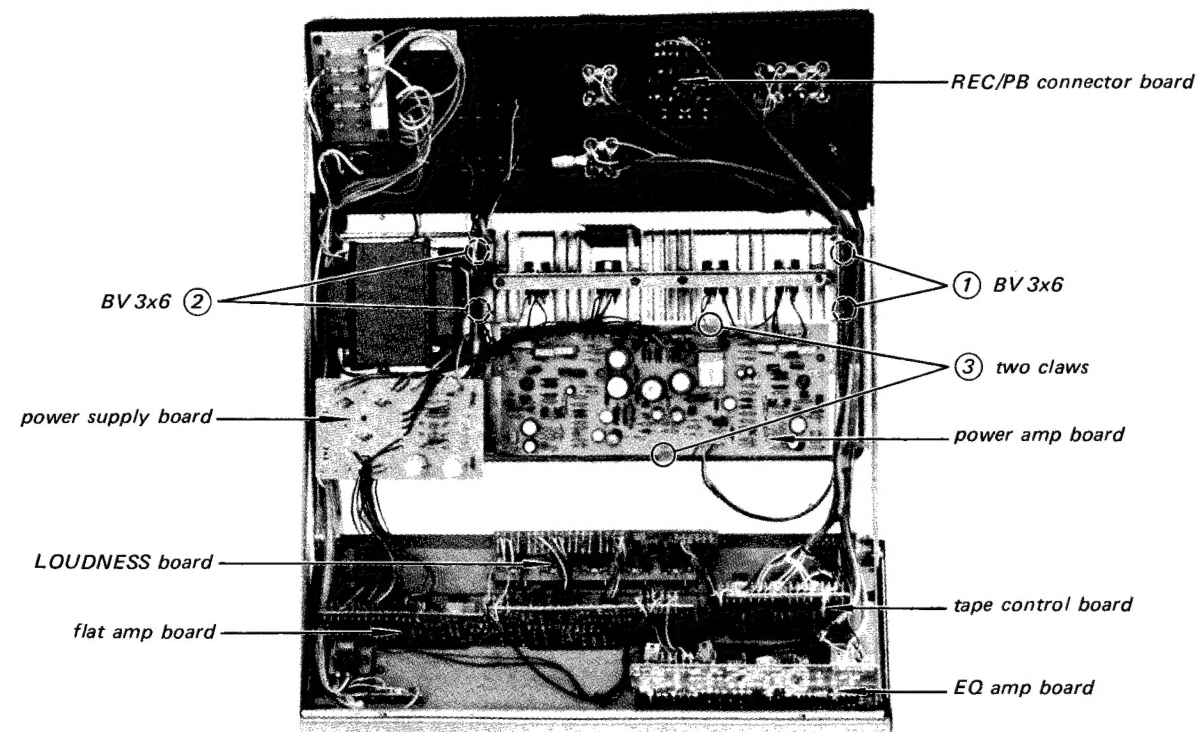
SIDE BOARD and TOP COVER REMOVAL



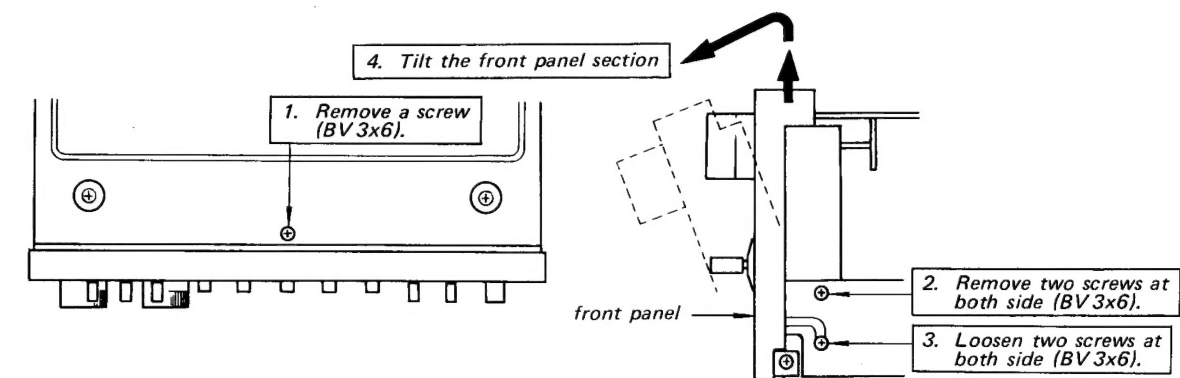
FRONT PANEL REMOVAL

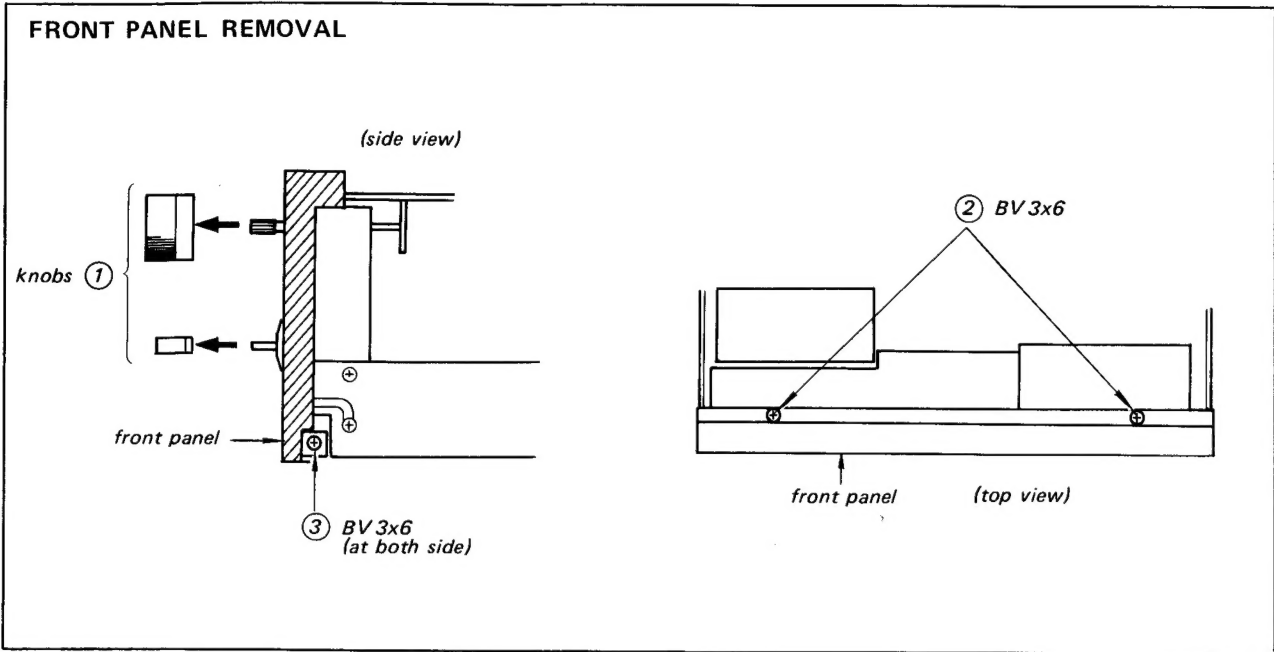


POWER AMP BOARD REMOVAL

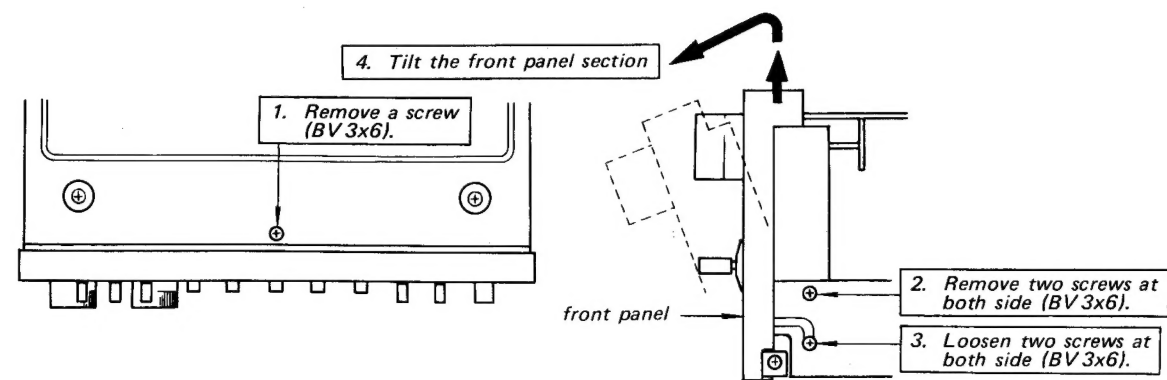


HOW TO RAISE THE CIRCUIT BOARDS (FLAT AMP, EQ AMP, TAPE CONTROL and LOUDNESS BOARDS)



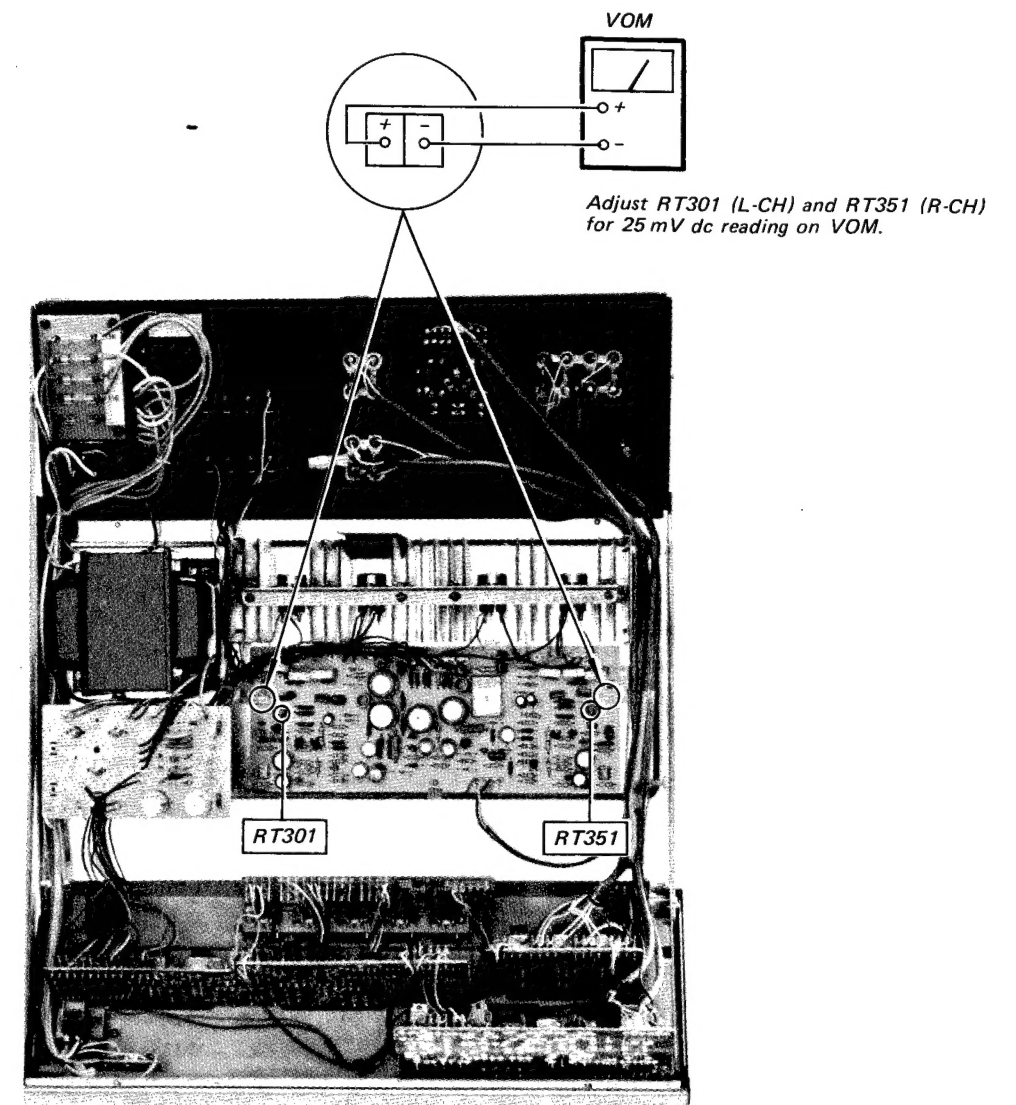


**HOW TO RAISE THE CIRCUIT BOARDS
(FLAT AMP, EQ AMP, TAPE CONTROL and LOUDNESS BOARDS)**



**SECTION 3
ADJUSTMENT**

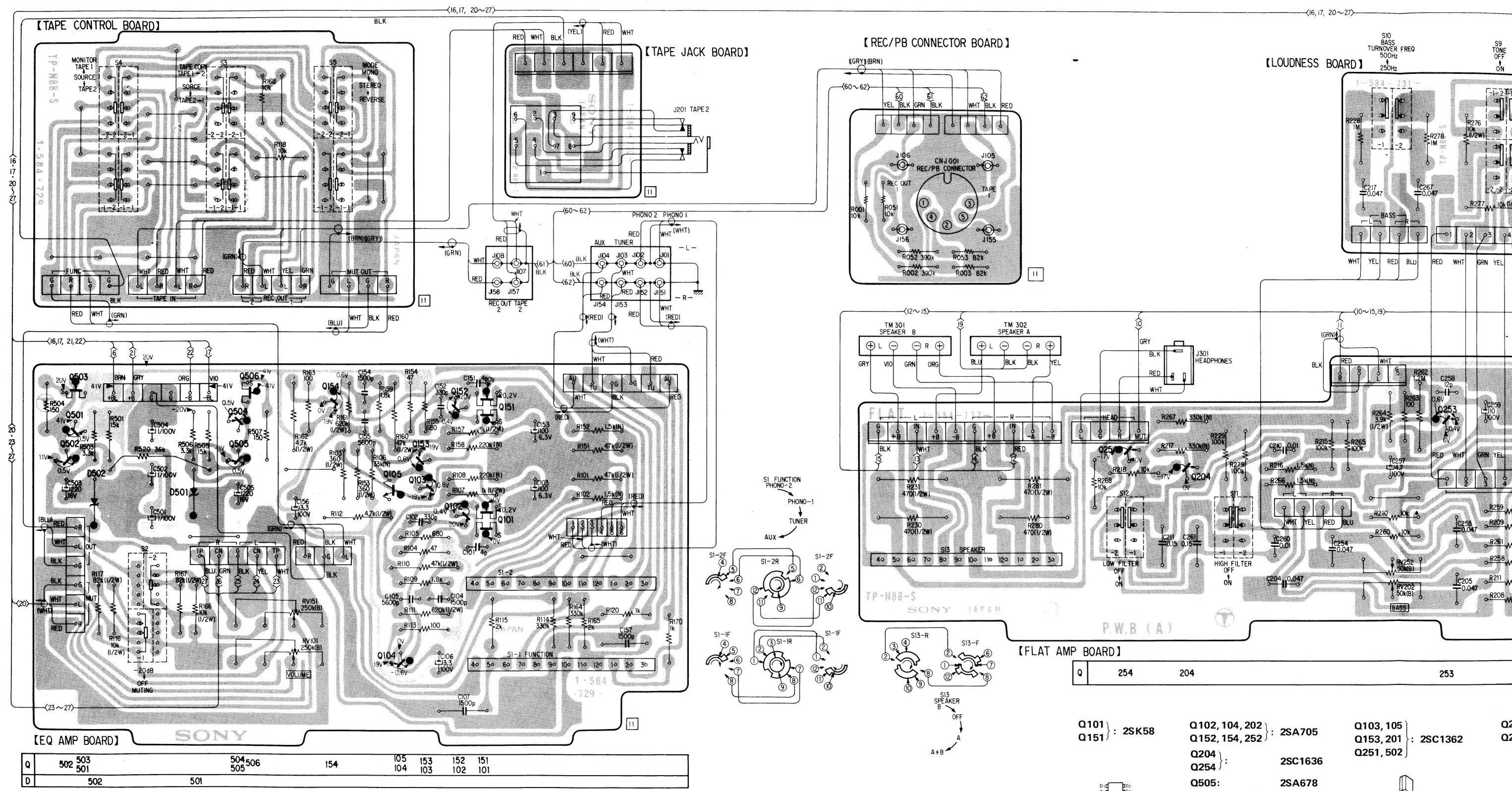
DC BIAS ADJUSTMENT

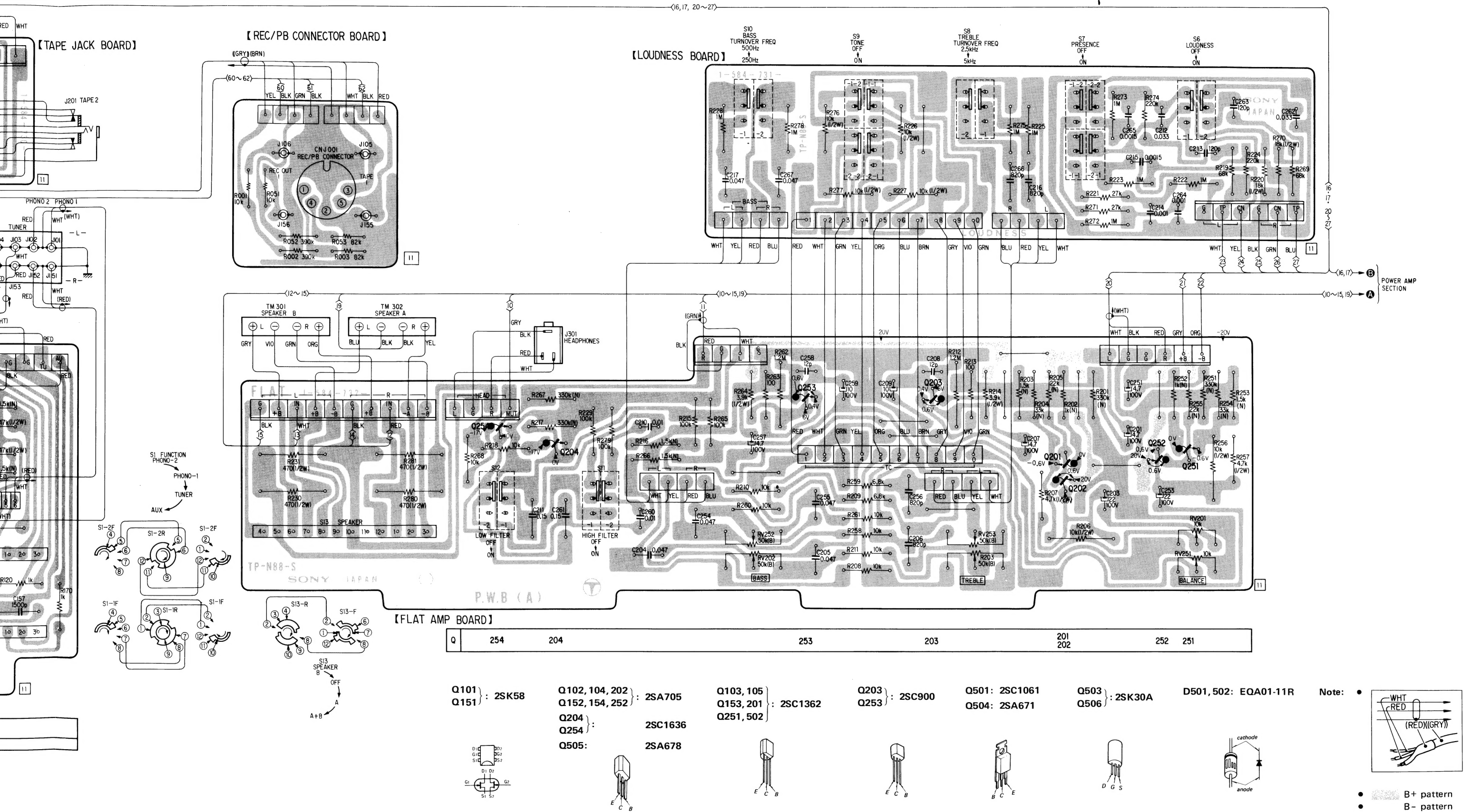


SECTION 4
DIAGRAMS

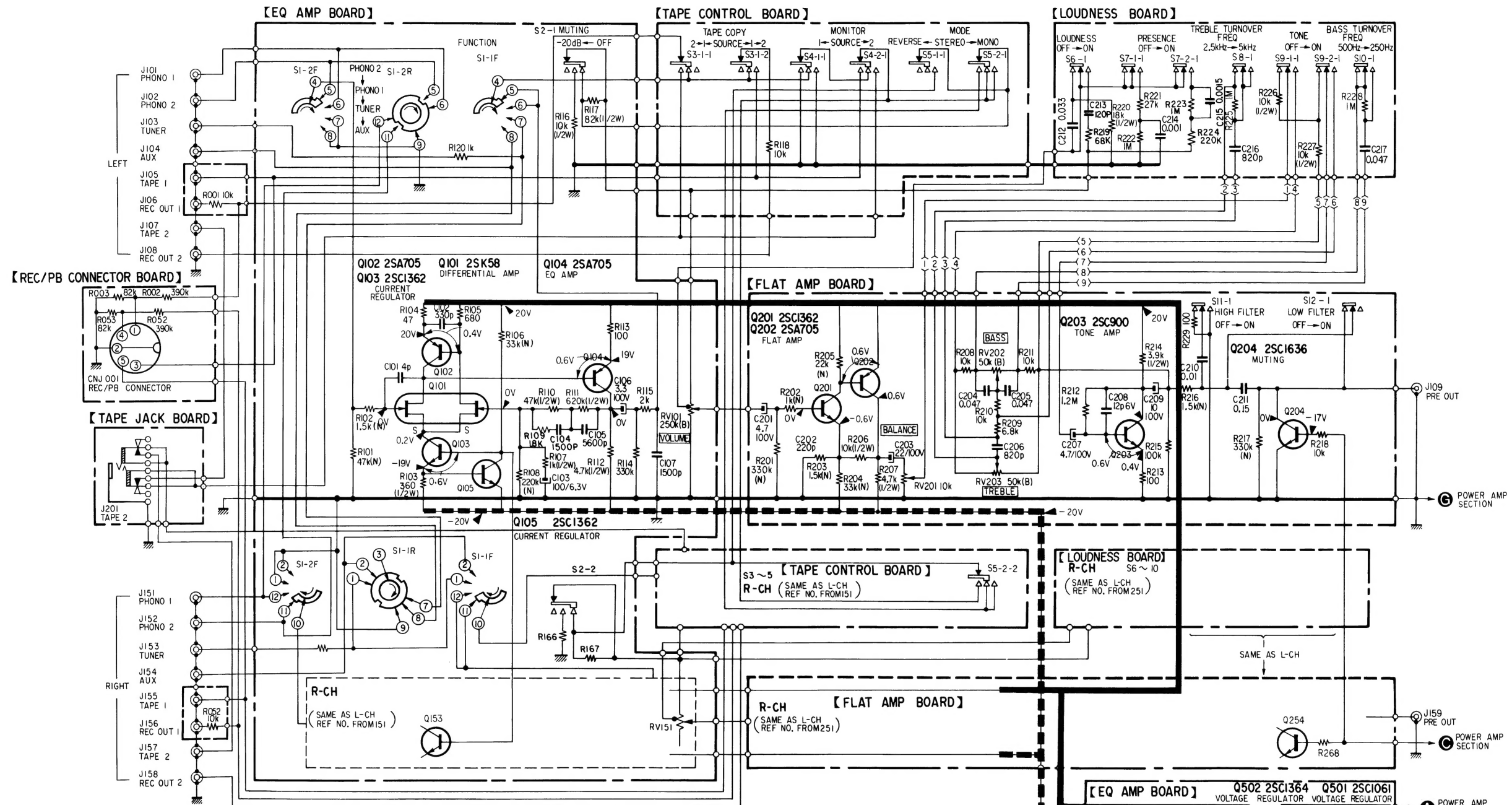
4-1. MOUNTING DIAGRAM – PREAMPLIFIER SECTION–

– Conductor Side –








4-2. SCHEMATIC DIAGRAM – PREAMPLIFIER SECTION –

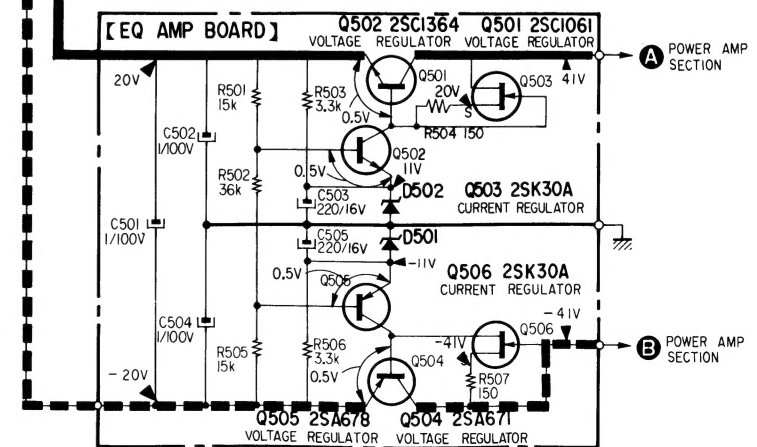


Note:

- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\mu\text{F}$
- All resistors are in Ω , $\frac{1}{4}\text{W}$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
-  indicates chassis ground.
- (N) indicates a low-noise resistor.
-  indicates B+ circuit.
-  indicates B- circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings are taken under no-signal conditions with a VOM ($20k\Omega/V$).
- Voltage variations may be noted due to normal production tolerances.
- Voltage between base and emitter are measured with 2.5V range.

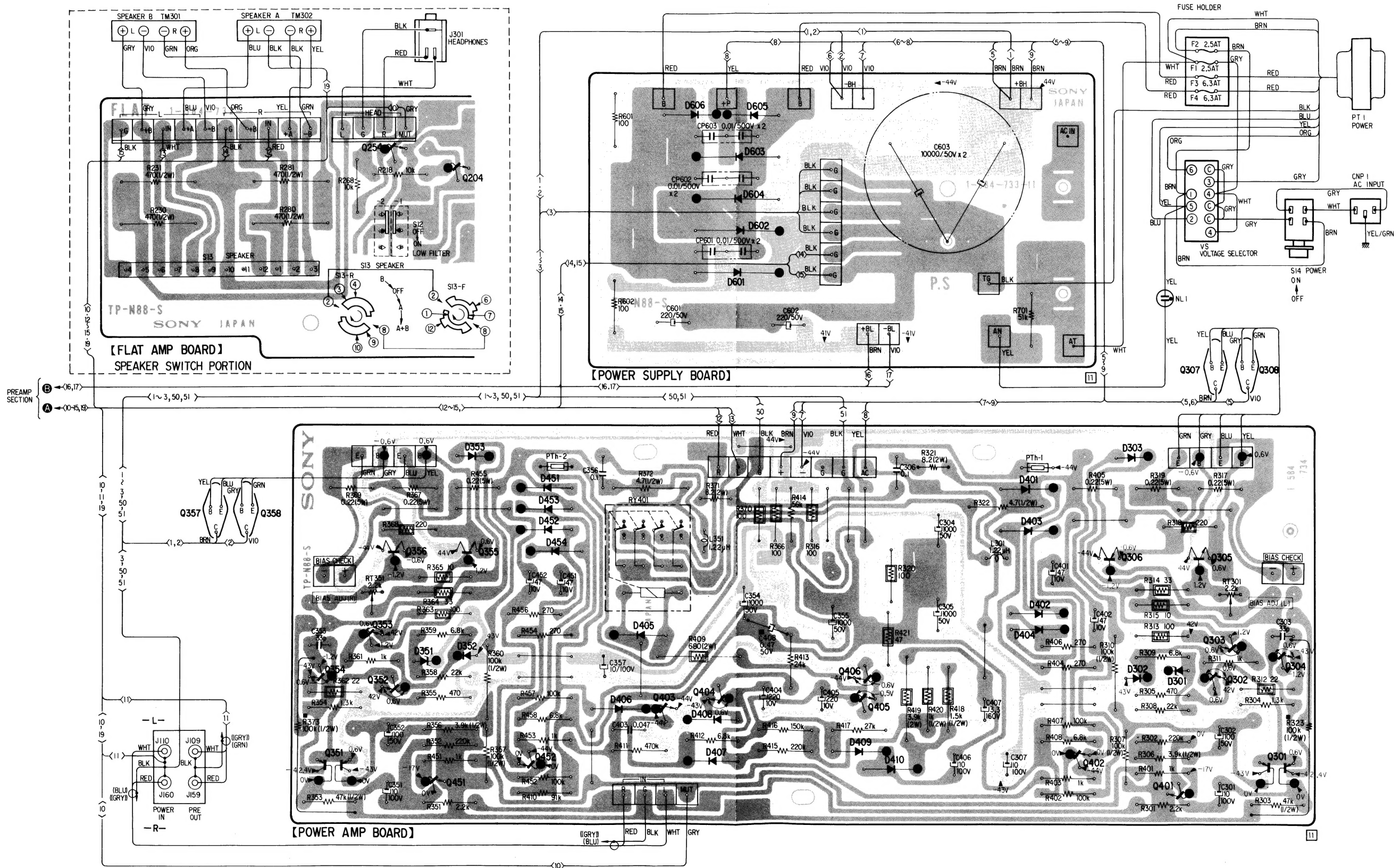
- **Switch Mode:**

Ref. No.	Switch	Position
S 1	FUNCTION	PHONO 2
S 2	MUTING	OFF
S 3	TAPE COPY	SOURCE
S 4	MONITOR	SOURCE
S 5	MODE	STEREO
S 6	LOUDNESS	OFF
S 7	PRESENCE	OFF
S 8	TREBLE TURNOVER FREQ	2.5 kHz
S 9	TONE	OFF
S10	BASS TURNOVER FREQ	500 Hz
S11	HIGH FILTER	OFF
S12	LOW FILTER	OFF

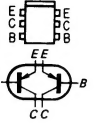


4-3. MOUNTING DIAGRAM – POWER AMPLIFIER SECTION –

— Conductor Side —



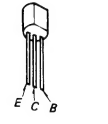
Q301 } : 2SA884
Q351 }



Q302 }
Q352 } : 2SA639S
Q402 }
Q452 }

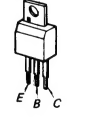
Q303 } : 2SA896
Q353 }

Q404 }
Q304 } : 2SC1811



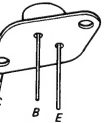
Q305 } : 2SC1663
Q355 }

Q306 } : 2SA835
Q356 }

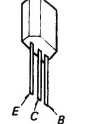


Q308 } : 2SB519
Q358 }

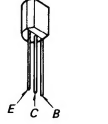
Q307 } : 2SD533
Q357 }



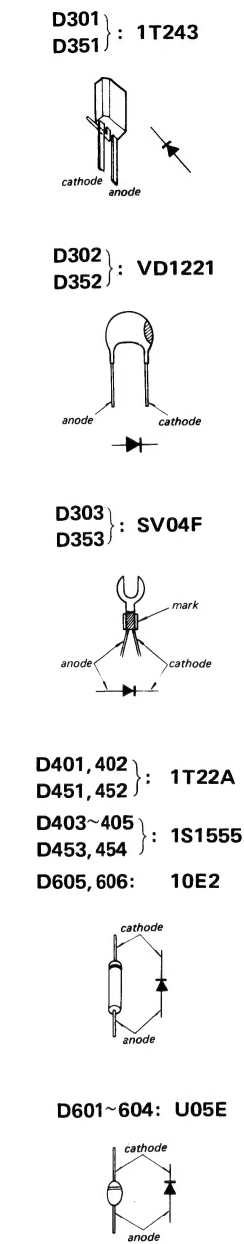
Q401 } : 2SC1636
Q451 }



**Q403 }
Q405 } : 2SC1364
Q406 }**

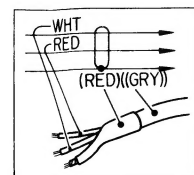


4-4. SCHEMATIC DIAGRAM — POWER AMPLIFIER SECTION —

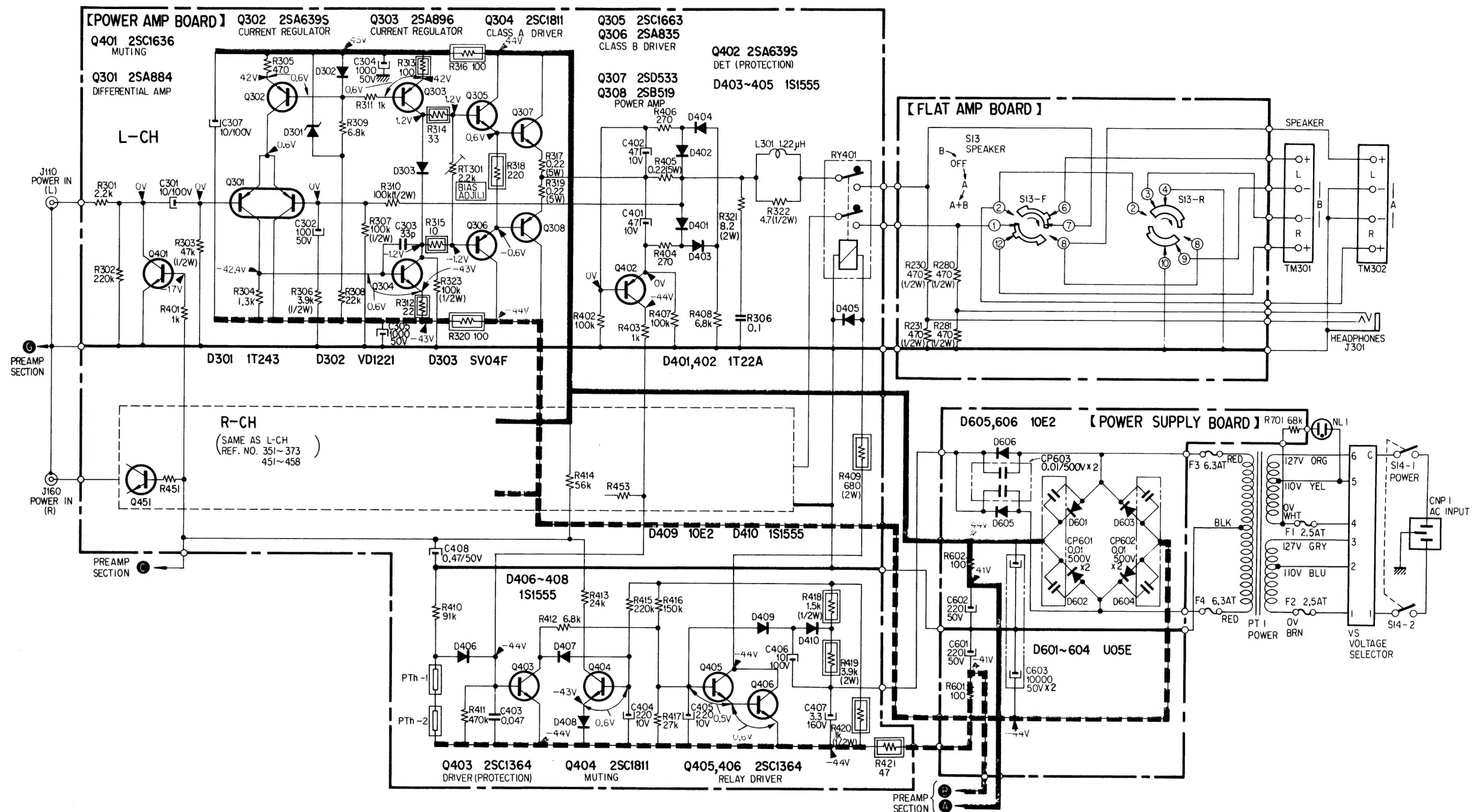


Note:

- indicates parts on the conductor side.
- indicates lead wire connection on the conductor side.
- indicates lead wire connection through the component side.



- B+ pattern
- B- pattern



Note:

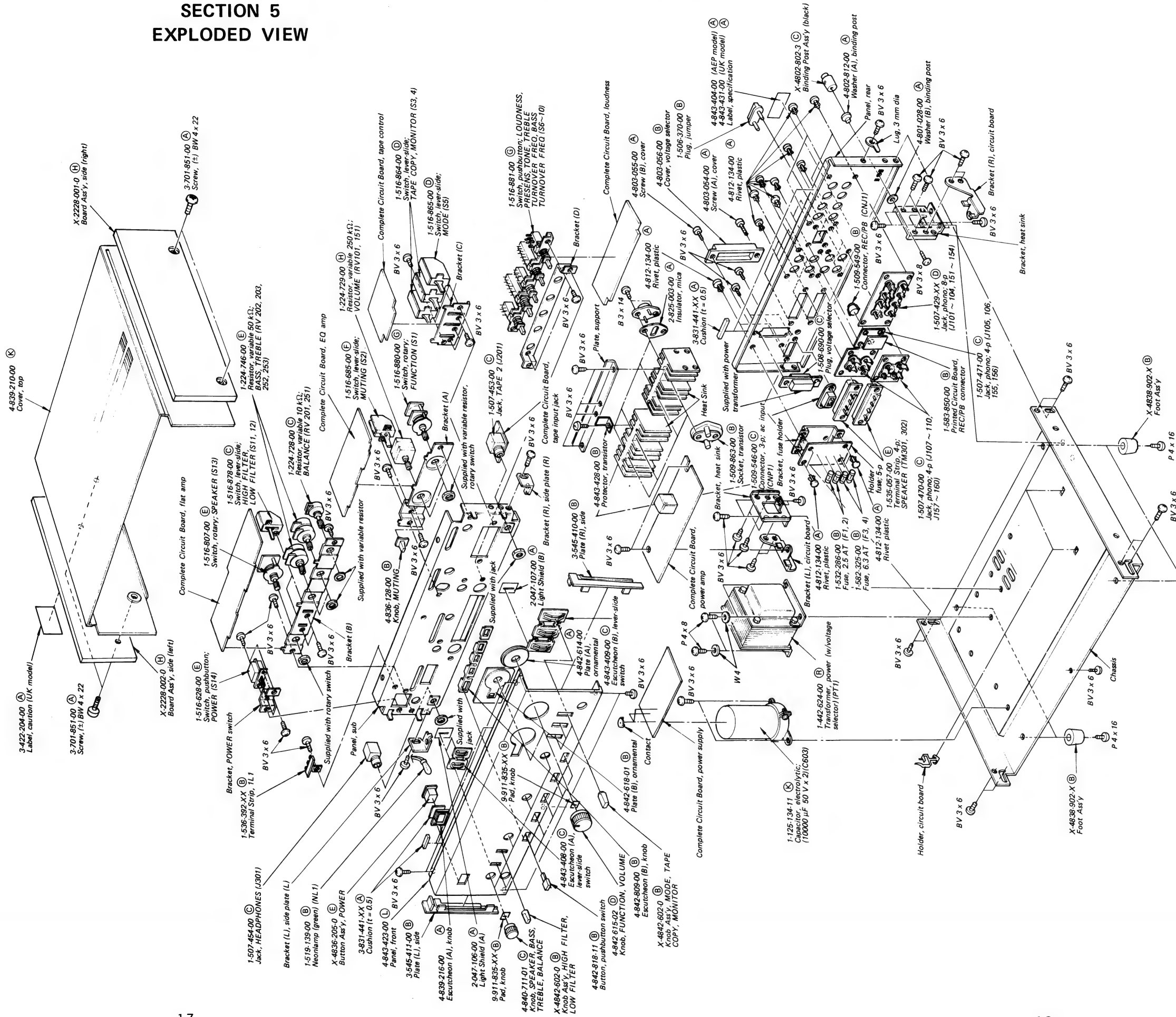
- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\text{F}$
- All resistors are in Ω , $\frac{1}{4}W$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
- /// indicates chassis ground.
- (N) indicates a low-noise resistor.
- indicates B+ circuit.
- indicates B- circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings are taken under no-signal conditions with a VOM (20 $k\Omega/V$).

- Voltage variations may be noted due to normal production tolerances.
- Voltage between base and emitter are measured with 2.5V range.
- Switch Mode:

Ref. No.	Switch	Position
S13	SPEAKER	B
S14	POWER	OFF

SECTION 5

EXPLODED VIEW



Note: The mark of \mathbb{A} to \mathbb{Z} : for European model.

- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (-) = slotted head
- (□□□) shows the number of coils in spring.

(-) = slotted head

- ($\square\square T$) shows the number of coils in spring.

SECTION 6 ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
PRINTED CIRCUIT BOARD			D302(352)	(B) VD1221	
			D303(353)	(B) SV04F	
1-583-850-00	(B) REC/PB Connector		D401(451)	(B) 1T22A	
			D402(452)		
			D403~405	(B) 1S1555	
			(D453~455)		
			D406~408	(B) 1S1555	
			D409	(B) 10E2	
			D410	(B) 1S1555	
			D501,502	(C) EQA01-11R	
			D601~604	(C) U05E	
			D605,606	(B) 10E2	
			PTh1,2	1-800-427-21	(R) Thermistor (positive), PTh487B
			Transformer		
			PT1	1-442-624-00	(R) Power (w/voltage selector)
SEMICONDUCTORS			CAPACITORS		
		Transistors	All capacitors are in μF and of electrolytic type unless otherwise noted. ($\mu = \mu\mu$) 50 or less working volts are omitted except for electrolytic type.		
Q101(151)	(F) 2SK58				
Q102(152)	(B) 2SA705		C101(151)	1-102-941-11	(A) 4p ceramic
Q103(153)	(B) 2SC1362		C102(152)	1-102-820-11	(A) 330p ceramic
Q104(154)	(B) 2SA705		C103(153)	1-131-295-11	(C) 100 6.3V tantalum
Q105	(B) 2SC1362		C104(154)	1-130-061-11	(B) 1500p 630V polypropylene film
Q201(251)	(B) 2SC1362		C105(155)	1-130-062-11	(B) 5600p 630V polypropylene film
Q202(252)	(B) 2SA705		C106(156)	1-121-995-11	(B) 3.3 100V
Q203(253)	(B) 2SC900		C107(157)	1-130-061-11	(B) 1500p 630V polypropylene film
Q204(254)	(B) 2SC1636		C201(251)	1-121-918-11	(A) 4.7 100V
Q301(351)	(D) 2SA884		C203(253)	1-121-996-11	(A) 22 100V
Q302(352)	(C) 2SA639S		C204(254)	1-108-845-12	(A) 0.047 mylar
Q303(353)	(C) 2SA896		C205(255)		
Q304(354)	(C) 2SC1811		C206(256)	1-103-773-11	(A) 820p polystyrol
Q305(355)	(D) 2SC1663		C207(257)	1-121-918-11	(A) 4.7 100V
Q306(356)	(E) 2SA835				
Q307(357)	(H) 2SD533				
Q308(358)	(L) 2SB519				
Q401(451)	(B) 2SC1636				
Q402(452)	(C) 2SA639S				
Q403	(B) 2SC1364				
Q404	(C) 2SC1811				
Q405,406	(B) 2SC1364				
Q501	(D) 2SC1061				
Q502	(B) 2SC1364				
Q503	(B) 2SK30A				
Q504	(E) 2SA671				
Q505	(C) 2SA678				
Q506	(B) 2SK30A				
		Diodes			
D301(351)	(B) 1T243				

• The mark of (A) to (Z) : for European model.

<i>Ref. No.</i>	<i>Part No.</i>	<i>Description</i>		
C208(258)	1-102-949-11	(A) 12p		ceramic
C209(259)	1-121-126-11	(A) 10	100V	
C210(260)	1-108-837-12	(A) 0.01		mylar
C211(261)	1-108-851-12	(A) 0.15		mylar
C212(262)	1-108-843-12	(A) 0.033		mylar
C213(263)	1-102-816-11	(A) 120p		ceramic
C214(264)	1-108-825-12	(A) 0.001		mylar
C215(265)	1-108-827-12	(A) 0.0015		mylar
C216(266)	1-103-773-11	(A) 820p		polystyrol
C217(267)	1-108-845-12	(A) 0.047		mylar
G301(351)	1-121-126-11	(A) 10	100V	
C302(352)	1-131-295-11	(C) 100	6.3V	tantalum
C303(353)	1-102-963-11	(A) 33p		ceramic
C304(354) C305(355)	1-123-061-11	(C) 1000	50V	
C306(356)	1-108-849-12	(A) 0.1		mylar
C307(357)	1-123-080-11	(B) 10	100V	
C401(451) C402(452)	1-121-352-11	(A) 47	10V	
C403	1-108-845-12	(A) 0.047		mylar
C404,405	1-123-072-11	(B) 220	10V	
C406	1-123-080-11	(B) 10	100V	
C407	1-123-109-11	(B) 3.3	160V	
C501,502	1-121-148-11	(A) 1	100V	
C503	1-121-421-11	(B) 220	16V	
C504	1-121-148-11	(A) 1	100V	
C505	1-121-421-11	(B) 220	16V	
C601,602	1-121-937-11	(B) 220	50V	
C603	1-125-134-11	(K) 10000+10000	50V	

RESISTORS

All resistors are in Ω . $\frac{1}{4}W$, $\pm 5\%$, carbon resistors (except special type) are omitted. Check schematic diagram for the resistance values. (k = 1,000, M = 1,000 k)

R101(151)	1-244-913-11	(A) 47 k	$\frac{1}{2}W$	carbon
R103(153)	1-244-862-11	(A) 360	$\frac{1}{2}W$	carbon
R107(157)	1-244-873-11	(A) 1 k	$\frac{1}{2}W$	carbon
R110(160)	1-244-913-11	(A) 47 k	$\frac{1}{2}W$	carbon

R111(161)	1-244-940-11	(A) 620 k	$\frac{1}{2}W$	carbon
R112(162)	1-244-889-11	(A) 4.7 k	$\frac{1}{2}W$	carbon
R116(166)	1-244-897-11	(A) 10 k	$\frac{1}{2}W$	carbon
R117(167)	1-244-919-11	(A) 82 k	$\frac{1}{2}W$	carbon
R206(256)	1-244-897-11	(A) 10 k	$\frac{1}{2}W$	carbon
R207(257)	1-244-889-11	(A) 4.7 k	$\frac{1}{2}W$	carbon
R214(264)	1-244-887-11	(A) 3.9 k	$\frac{1}{2}W$	carbon
R220(270)	1-244-903-11	(A) 18 k	$\frac{1}{2}W$	carbon
R226(276) R227(277)	1-244-897-11	(A) 10 k	$\frac{1}{2}W$	carbon
R230(280) R231(281)	1-244-865-11	(A) 470	$\frac{1}{2}W$	carbon
R303(353)	1-244-913-11	(A) 47 k	$\frac{1}{2}W$	carbon
R306(356)	1-244-887-11	(A) 3.9 k	$\frac{1}{2}W$	carbon
R307(357) R310(360)	1-244-921-11	(A) 100 k	$\frac{1}{2}W$	carbon
R312(362)	1-211-506-11	(A) 22	$\frac{1}{4}W$	nonflammable
R313(363)	1-211-522-11	(A) 100	$\frac{1}{4}W$	nonflammable
R314(364)	1-211-510-11	(A) 33	$\frac{1}{4}W$	nonflammable
R315(365)	1-211-498-11	(A) 10	$\frac{1}{4}W$	nonflammable
R316(366)	1-211-522-11	(A) 100	$\frac{1}{4}W$	nonflammable
R317(367)	1-217-156-11	(A) 0.22	5W	wire-wound
R318(368)	1-211-530-11	(A) 220	$\frac{1}{4}W$	nonflammable
R319(369)	1-217-156-11	(A) 0.22	5W	wire-wound
R320(370)	1-211-522-11	(A) 100	$\frac{1}{4}W$	nonflammable
R321(371)	1-258-223-11	(A) 8.2	2W	carbon
R322(372)	1-244-817-11	(A) 4.7	$\frac{1}{2}W$	carbon
R323(373)	1-244-921-11	(A) 100 k	$\frac{1}{2}W$	carbon
R405(455)	1-217-156-11	(A) 0.22	5W	wire-wound
R409	1-206-660-11	(A) 680	2W	metal oxide
R418	1-211-642-11	(A) 1.5 k	$\frac{1}{2}W$	nonflammable
R419	1-206-678-11	(A) 3.9 k	2W	metal oxide
R420	1-211-638-11	(A) 1 k	$\frac{1}{2}W$	nonflammable
R421	1-211-514-11	(A) 47	$\frac{1}{4}W$	nonflammable
R501	1-244-901-11	(A) 15 k	$\frac{1}{2}W$	carbon
R502	1-244-910-11	(A) 36 k	$\frac{1}{2}W$	carbon
R503	1-244-901-11	(A) 15 k	$\frac{1}{2}W$	carbon
RT301(351)	1-224-250-XX	(C) 2.2 k, adjustable		
RV101(151)	1-224-729-00	(H) 250 k, variable; VOLUME		

• The mark of (A) to (Z) : for European model.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
RV201(251)	1-224-728-00	Ⓒ 10 k, variable; BALANCE
RV202(252)	1-224-746-00	Ⓔ 50 k, variable; BASS, TREBLE
RV203(253)		

SWITCHES

S1	1-516-880-00	Ⓖ Rotary, FUNCTION
S2	1-516-685-00	Ⓕ Lever-slide, MUTING
S3,4	1-516-864-00	Ⓓ Lever-slide, TAPE COPY, MONITOR
S5	1-516-865-00	Ⓓ Lever-slide, MODE
S6~10	1-516-881-00	Ⓖ Pushbutton, LOUDNESS, PRESENCE, TONE, TURNOVER FREQ (BASS, TREBLE)
S11,12	1-516-878-00	Ⓒ Lever-slide, HIGH FILTER, LOW FILTER
S13	1-516-807-00	Ⓔ Rotary, SPEAKER
S14	1-516-628-00	Ⓔ Pushbutton, POWER

JACKS

J101~104 (J151~154)	1-507-429-XX	Ⓓ Phono, 8-P
J105,106 (J155,156)	1-507-471-00	Ⓒ Phono, 4-P
J107~110 (J157~160)	1-507-470-00	Ⓒ Phono, 4-P
J201	1-507-453-00	Ⓒ TAPE 2
J301	1-507-454-00	Ⓒ HEADPHONES

• The mark of Ⓐ to Ⓔ : for European model.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
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MISCELLANEOUS

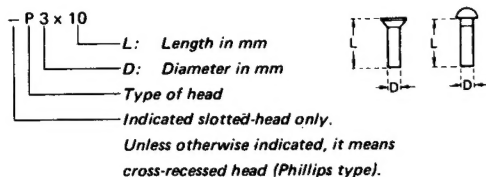
CNJ1	1-509-549-00	Ⓑ Connector, REC/PB
CNP1	1-509-546-00	Ⓒ Connector, 3-P; ac input
CP601~603	1-102-355-11	Ⓑ Encapsulated Component
F1,2	1-532-286-00	Ⓑ Fuse, 2.5AT
F3,4	1-532-325-00	Ⓑ Fuse, 6.3AT
NL1	1-519-139-00	Ⓑ Neon lamp (green)
RY401	1-515-257-00	Ⓗ Relay
TM301,302	1-535-057-00	Ⓔ Terminal Strip, 4-P; SPEAKER
	1-506-370-00	Ⓑ Plug, jumper
	1-508-690-00	Ⓒ Plug, voltage selector
	1-509-863-00	Ⓑ Socket, transistor
	1-536-392-XX	Ⓑ Terminal Strip, 1L1

ACCESSORIES

1-506-113-00	Ⓑ Plug, shorting
1-534-819-00	Ⓖ Cord, power
3-780-852-11	Ⓑ Manual, instruction

HARDWARE NOMENCLATURE

Screw:



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
SCREWS			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
SELF-TAPPING SCREWS			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
SET SCREWS			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
NUT			
N		nut	
WASHERS			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
RETAINING RINGS			
E		retaining ring	
G		grip-type retaining ring	

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